

June 18, 2012

Mr. Scott Nally, Director
Ohio Environmental Protection Agency
c/o Mr. Jeremy Carroll, RISS, DMWM
50 W. Town Street, Suite 700
Columbus, OH 43215

RE: Envirosafe Services of Ohio, Inc.
 Ohio EPA ID No. 03-48-0092
 USEPA ID No. OHD 045 243 706
 Permit Modification Request No. 074:
 Revision of TLL Compliance Date at SWMU 6

Dear Mr. Nally:

In accordance with OAC 3745-50-51(D)(1)(b), Envirosafe Services of Ohio, Inc. (ESOI) hereby submits a Class 1 permit modification notification requiring prior approval by the Director to the Ohio Environmental Protection Agency (Ohio EPA) for the Hazardous Waste Facility Installation and Operation Permit issued to its Oregon, Ohio waste management facility to revise Threshold Leachate Level Compliance Dates for Solid Waste Management Units (SWMUs) 5, 6, and 7 in Module E of the Permit.

A detailed description of the progress made to date, lessons learned, upgrades and modification installed, and a revised compliance date are presented in the attached permit modification request.

Posting Instructions for this Modification:

Replace existing Permit page 83 with the enclosed page 83 dated June 18, 2012 identified as Modification 074.

In accordance with OAC 3745-50-51(D)(1)(a)(ii), a notice of this modification will be sent to all persons on the facility mailing list and the appropriate units of State and local government (upon approval by Ohio EPA). A copy of the proposed notification has been included with this letter.

Certification for this submittal:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate,

and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact Kenneth Humphrey at (419) 698-3500, extension 246.

Sincerely,

A handwritten signature in black ink, appearing to read "Douglas E. Roberts", with a long horizontal flourish extending to the right.

Douglas E. Roberts,
President

Enclosures

Courtesy Copy:

Ms. Lynn Ackerson, Ohio EPA, DERR, NWDO w / attachments
Mr. Michael Terpinski, Ohio EPA, DERR, NWDO w / attachments
Mr. John Pasquarette, Ohio EPA, DMWM, NWDO w / attachments
Mr. Peter Ramanauskas, USEPA Region 5 (electronic copy)
Mr. Ken Humphrey, ESOI w / attachments
Mr. Stephen DeLussa, Envirosource Technologies, Inc. (electronic copy)

In accordance with Section E of its Ohio Hazardous Waste Facility Installation and Operation Permit, EnviroSAFE Services of Ohio, Inc. ("ESOI") is implementing a Corrective Action Program ("CAP") to assess releases of hazardous wastes or hazardous constituents, if any, for the purpose of protecting human health and the environment. One aspect of the CAP has been and continues to be assisting with determining and addressing the extent of hazardous constituents reported in groundwater adjacent to SWMUs 5 and 6.

History

The RFI identified significant volumes of accumulated leachate in SWMUs 5, 6, and 7. These units, pre-RCRA waste landfills that did not have leachate recovery systems installed at the time of construction, were identified as the probable source of contamination found in the contact zone waters immediately surrounding them. As such, the presumptive measure evaluated was to install a leachate recovery system in each of these units. To support the design of these systems, data regarding the sustainable leachate recovery rate, area of influence for a leachate extraction well, and leachate characteristics were required. To obtain this information, ESOI prepared a Presumptive Corrective Measures Design Work Plan which included the performance of leachate recovery testing on SWMU 6. Based on the results of the tests at SWMU 6, a Presumptive Corrective Measures Design Work Plan Modification was submitted to Ohio EPA. This plan included the results from the SWMU 6 testing, and provided the scope of work for similar testing on SWMU 5 and 7.

ESOI submitted the results of the predesign studies for SWMUs 5, 6 and 7 in the Pump Test Report and 30% Presumptive Corrective Measures Design. Based on these study results, ESOI proposed to install a recovery well system of 2, 5 and 3 recovery wells in SWMUs 5, 6, and 7, respectively. The report was approved by Ohio EPA by letter dated November 13, 2006. The 90% Presumptive Corrective Measures Design for equipment and layout was completed in December 2006. ESOI submitted a permit modification request to include detailed performance objectives and a performance monitoring program to Ohio EPA on January 12, 2007. The performance objectives include 1) reducing head levels within the SWMUs, 2) establishing an inward hydraulic gradient, and 3) achieving target leachate levels by specified dates. The permit modification was approved on March 16, 2007. Installation of the leachate recovery systems was performed from February through June 2007, and the systems became fully operational on July 1, 2007.

System Optimization

The system was then optimized as necessary to produce the highest leachate recovery possible. Optimization included programming individualized pump rates for each well to achieve as close to an uninterrupted flow from each well as possible, addition of heaters to control panels to prevent freezing of electronics during very cold weather, and installation of external stroke counters on control panels so they do not have to be opened to obtain the data. Based upon several conversations and meetings with Ohio EPA regarding the OMPM Plan, ESOI conducted a preliminary assessment of the pumping system; the results were provided in a December 8, 2008 letter RE: Evaluation of Pump Performance in Leachate Recovery Wells 1 through 10, SWMUs 5, 6, and 7, EnviroSAFE Services of Ohio, Inc., 876 Otter Creek Road, Oregon, Ohio 43616 submitted to Ohio EPA on December 30, 2008. The objective of this assessment was to determine 1) how the performance of each leachate recovery pump compares with design performance, and 2) the ability of the systems to achieve the permitted target leachate levels and compliance dates without modifying the target levels to account for the refined landfill base contours. All recommendations developed

from the preliminary assessment have been addressed. The most notable finding from the assessment resulted in a significant change to some of the original design assumptions. Based on the data collected during installation of wells and piezometers, it was discovered that the base contours and unit details were not as originally theorized. Every boring into the units helps to better define the base contours. The data collected was used to recalculate average target leachate elevations to achieve a 90% reduction in head level. It was also determined that the base of some piezometers is located above the target leachate level (shallow piezometers). The measured leachate levels of all piezometers in a unit were averaged to determine compliance with the target level. However, if the base levels of these piezometers are used when the well is dry, the calculated average elevation across the unit is skewed and the target level would be difficult, or in some cases impossible, to ever achieve. Therefore, the elevations of the shallow piezometers should not be included in the calculation once they are dry. A permit modification to address the changed elevations and method for determining them was approved on August 23, 2010. The modification also added response actions to be taken under various circumstances.

As part of the ongoing evaluation, other changes have been made since that time. Most notably:

- Installing reliable weatherproofing of the wire connections for the pump actuator limit switches;
- Evaluating the down hole components of recovery well RW-10;
- Discontinuing use of the automatic level controls and operating the pumps in manual mode with the pump speeds set to run continuously at 5 strokes per minute;
- Eliminating stoke counts as a means of estimated flow as it has been proven to be unreliable;
- Adding a tap on the recovery well discharge to estimate the rate of flow using a calibrated bucket;
- Evaluating chemical methods (e.g., dispersants) to dissolve viscous organic material that may be blinding the recovery wells screens and filter packs. A chemical has been identified and field testing is going to be conducted;
- Changing the type of pumps used for better performance (reciprocating to centrifugal); and
- Installing more wells and changing how some of the existing wells are utilized (experience has revealed that certain types of wells and well designs perform better than others: 1) originally there were separate recovery wells and piezometers; 2) ESOI then converted some of those wells so they can be used for both purposes (only those wells that have a diameter sufficient to contain a pump and still have room to take piezometer readings); and 3) the latest design is a nested recovery well and piezometer (two casings in one hole- one for pumping and one for piezometer measurements).

System Failures

There have been two significant failures of the system to date. Specifically, the well casings in RW-10 and RW-4 shifted causing them to bend and/or break or make it impossible to remove and/or repair the equipment installed in them. This also inhibited the ability to take accurate level measurements. The shifting of the wells is attributed to waste movement and subsidence within the landfills as leachate is removed. The two wells have been taken out of service and replaced as necessary. A potential exists for this to occur at any of the pumping wells. Well integrity is evaluated during routine monitoring and maintenance activities. Corrective actions are taken based on the severity of the problem found.

System Achievements

The original Recovery Well System consisted of 10 recovery wells and 15 interior piezometers to evaluate leachate levels across each unit. ESOI undertook expansion of the leachate extraction system in 2010 to implement various recommendations made in the 2-Year Evaluation Report. As part of the on-going evaluation of the Recovery Well System, ESOI expanded the recovery system again in 2011. The System now consists of 10 recovery wells, 17 interior piezometers, 4 dual purpose wells, and 8 nested recovery wells and piezometers. The total number of wells with pumps has increased from 10 to 22 (of which 1 is inactive -RW-7 is dry, the pump is inactive and the well used as a piezometer). The total number of wells used for piezometer readings has increased from 15 to 29 (30 if RW-7 is included).

Since start-up on July 1, 2007, over 5 million gallons of leachate have been removed from the units and disposed at an off-site waste water treatment facility. An inward gradient has been established so that the potential for leachate to flow out of the units into the upper till contact zone with the lacustrine zone has been eliminated and the leachate head levels have been reduced thereby reducing the force of downward and outward pressure into the underlying glacial tills.

Measures Underway to Reduce Infiltration

In an effort to minimize potential for storm water infiltration, ESOI is expediting implementation of a corrective measure outlined in the CMS Report. Storm water runoff flows via sheet flow into the grass swales that surround the SWMUs. Removing the existing vegetation, eliminating depressions within these swales, and lining the swales with a geomembrane liner or similar impermeable material will prevent storm water ponding and infiltration into the landfills. The storm water collection area at the southwest corner of SWMU 6 will also be lined to prevent infiltration of detained storm water. In addition, intermediate drainage ditches will be installed on the north and south slopes of SWMUs 6 and 7 to intercept sheet flow and direct this storm water off the landfill to reduce flows in the north and south perimeter ditches. A new small retention area or altered flow path will be developed to accommodate the increased pace of flow. It is anticipated that these improvements will be completed over the next six months; completed by the end of 2012.

Leachate Elevation Monitoring

Measuring leachate elevations has proven to be very difficult. A number of factors have been identified that interfere with obtaining readings that accurately reflect the leachate levels in each unit.

- Thick viscous NAPL is present in some of the wells and piezometers. This NAPL interferes with determining the amount of leachate present under the NAPL and the NAPL thickness. Multiple phase interface probes have not proven useful. The NAPL is too thick and coats the entire probe. To address the issue, inserts consisting of 1" PVC piping have been installed in wells where this problem exists if the well diameter was large enough to accommodate the insert. A piece of plastic wrap was placed on the end of the pipe before insertion and then poked out after the insert reached the bottom of the well. This allows only the leachate to enter from the bottom; the NAPL floating on the top is not able to enter from the bottom. However, some of the piezometers are 1" in diameter and inserts are not possible. The readings from these piezometers remain questionable.

- Some of the wells have been converted to dual purpose wells meaning that a pump has been placed in some of the existing piezometers if the casing was large enough to accommodate the pump. The well is now used to both pump leachate and monitor elevations. However, some of these wells are packed tightly with equipment which causes a variety of problems when inserting the level probe to obtain the leachate elevation. In some cases, the probe is not able to pass by the equipment or provides false readings when moisture on the equipment indicates that the probe has encountered water. Readings from these piezometers is often questionable.
- As noted above, the waste around many of the wells has shifted causing the well casings to bend (i.e., the well is not longer a straight line downward). This often causes the elevation probe to come in contact with the side of the casing. Many of the casings have been coated with thick viscous NAPL or are simply wet. Both of these issues may cause the probe to provide an inaccurate leachate elevation reading. This problem is compounded when pumping equipment is in the same well as noted above. Readings from these piezometers is often questionable.
- All of the wells have long lengths of well screen to provide ample opportunity to collect leachate. However, this also provides wet or dirty surfaces that may interfere with level measurements.
- The landfill units contain wastes and soils of varying densities and permeability. Historical aerial photographs show the units were constructed as a series of trenches in various directions with access ramps and roadways. As more wells have been installed and maps drawn of the potentiometric leachate surfaces, it is becoming clear that some of the wells and piezometers are likely located in a trench sidewall or access ramp or roadway. Measurements taken from these wells are not representative of leachate in the waste areas. These piezometers collect leachate but are not affected by pumping wells in very close proximity. ESOI believes readings from these wells should not be used to evaluate compliance with target leachate levels. Also, the varying density and permeability of the waste itself may inhibit drainage of leachate from the wells once the leachate level has dropped leaving pockets of liquid in various places that are not representative of the overall leachate level and not likely to be impacted by any type of leachate extraction system. Reading from piezometers located in less permeable wastes is questionable.

A new idea came during preparation of this document: Evaluate different level probe designs and test those that may provide less interference from some of the difficulties noted above. An ideal probe would be slimmer in design so to more easily pass by equipment and the probe itself would be shielded by an outer shell to prevent incidental contact with NAPL, moisture, and equipment. ESOI is moving forward with the search and testing for this type of probe and will inform Ohio EPA of its findings.

Quantity of Leachate Remaining

Estimating the amount of leachate present is very difficult. It is mostly dependent on two variables: density/porosity of the waste and a 3 dimensional understanding of the unit. Since this is a pre-RCRA industrial landfill unit, the densities/porosities will vary with the type of waste. There are no records to indicate exactly what is in the landfill and where it is located. Therefore there is no typical expected density/porosity that can be used. Also, since the units were mostly constructed without plans or consistency, the sub grade contour is unknown. There is clear evidence from the well borings that the bottom is not uniform. The reaction of leachate levels to pumping indicate that some walls exist within the units.

The following is a crude method to estimate the remaining leachate above the TLL using SWMU 6 as an example. Approximately 2 million gallons of water have been removed from the unit. The measured level (that ESOI believes is inaccurate as stated above) has dropped approximately 15 feet since 2007. If there are still 10 feet remaining above the TLL and all else is equal, approximately 1.3 million gallons remains above the TLL. However, all else is not equal. The deeper into the units, the less uniform the contour. If it were accurate, there will have been approximately 3.3 million gallons of leachate above the TLL. ESOI believes that is an unreasonably large amount to be contained in that unit above the TLL. Currently there are 8 wells pumping on SWMU 6. The average amount collected since January is 1,644 gallons/day or about 600,000 gallons per year. Therefore approximately 2 additional years would be required to achieve the TLL. As provided above, ESOI believes that the leachate levels are lower than currently being recorded and thereby less leachate than calculated remains above the TLLs.

Target Leachate Levels

The permit specifies dates by which the Target Leachate Levels (TLLs) must be achieved. These dates are milestone events in the process of dewatering the landfills. Pumping will continue beyond this date and for as long as leachate is present.

- The milestone date for SWMU 6 is July 1, 2012. The TLL to be achieved by that date is 566.9 ft. MSL. The current level (as of early May) based on the piezometer measurements outlined in the approved Operations Maintenance and Performance Monitoring Plan is 577 ft. MSL.
- The milestone date for SWMU 7 is July 1, 2014. The TLL to be achieved by that date is 570.8 ft. MSL. The current level (as of early May) based on the piezometer measurements outlined in the approved Operations Maintenance and Performance Monitoring Plan is 579 ft. MSL.
- The milestone date for SWMU 5 Central Area is July 1, 2016. The TLL to be achieved by that date is 557.1 ft. MSL. The current level (as of early May) based on the piezometer measurements outlined in the approved Operations Maintenance and Performance Monitoring Plan is 573 ft. MSL.
- The milestone date for SWMU 5 West Area is July 1, 2016. The TLL to be achieved by that date is 564.9 ft. MSL. The current level (as of early May) based on the piezometer measurements outlined in the approved Operations Maintenance and Performance Monitoring Plan is 572 ft. MSL.

ESOI is requesting a 12 month extension of the SWMU 6 TLL milestone date to July 1, 2013. This will enable ESOI to complete the expedited corrective measures related to storm water management and evaluate approximately 6 months of response to the action. It will also provide ESOI with time to test different level probes, compare level reading, and evaluate the accuracy of the historical data. ESOI is also requesting that the following piezometers be excluded from TLL calculations as they are not representative of the overall leachate level in SWMU 6: PZ-1 and PZ-2 (and PZ-4 and PZ-14 which are already listed as shallow piezometers in the approved OMPM Plan). The enclosed drawing from the 2011 Annual Report clearly shows that these wells are not located in a formation that is strongly affected by pumping of adjacent wells. While the elevations have lowered over time and provide an indication of dewatering, the downward trend has significantly slowed indicating that the leachate level is now below a less permeable wall. While the wall will drain slowly, it is not representative of the leachate level across the unit.

Historical aerial photographs presented in the RFI also indicate that they may be located in an access ramp, roadway or trench sidewall.

OMPM Plan

A revised OMPM Plan to include all the new wells installed and revisions of what wells should be included in the TLL calculations is being finalized at this time. It will be submitted under separate cover as a Class 1A permit modification request. Please note that the currently calculated leachate elevations are based only on the piezometers listed in the currently approved OMPM Plan. Inclusion of the new level points is expected to provide a better understanding of the actual leachate level across each unit.

leachate to the lowest level which is practicably achievable at a frequency that will promote removal without compromising equipment functionality. These performance objectives will be implemented by the following:

- (a) The permittee will decrease the volume of the contaminant sources by reducing head levels within the WMUs. The permittee will demonstrate that this objective is achieved at each WMU by documenting that the head levels at established interior piezometers, as identified in Table 1.0 of the OMPM Plan, have a decreasing trend. This objective must be achieved no later than July 1, 2009 and sustained until Permit Condition E.9(b)(i)(b) is established.
- (b) The permittee will demonstrate that an inward hydraulic gradient is established by documenting that the average leachate level head potential at a WMU's interior piezometers, as identified in Table 1.0 of the OMPM Plan, is at least 1-foot lower than the average liquid potential in established perimeter shallow till wells, as identified in Table 1.0 of the OMPM Plan. This objective must be achieved not later than July 1, 2010 and sustained until Permit Condition E.9(b)(i)(c) is established.
- (c) WMU 6: No later than July 1, ~~2012~~2013, the permittee will ensure that the average of the leachate head level measurements from the deep interior piezometers, as identified in Table 1.0 of the OMPM Plan, is maintained below a Target Leachate Level of 566.9 ft. MSL and that the WMU is effectively dewatered in the vicinities of the shallow interior piezometers as identified in Table 1.0 of the OMPM Plan.

WMU 7: No later than July 1, 2014, the permittee will ensure that the average of the leachate head level measurements from the deep interior piezometers, as identified in Table 1.0 of the OMPM Plan, is maintained below a Target Leachate Level of 570.8 ft. MSL and that the WMU is effectively dewatered in the vicinities of the shallow interior piezometers as identified in Table 1.0 of the OMPM Plan.

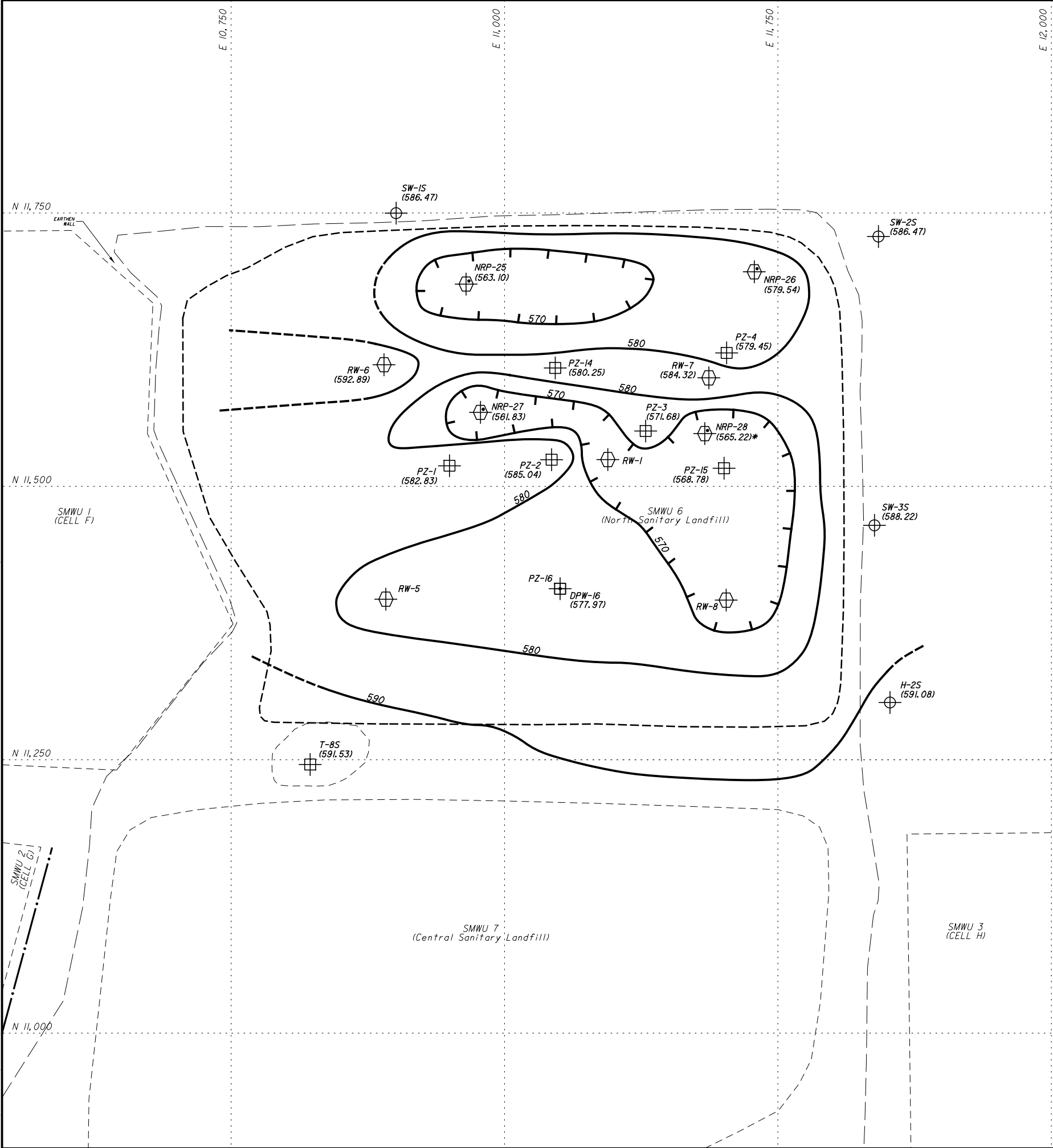
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WMU 5 Central Area: No later than July 1, 2016, the permittee will ensure that the average of the leachate head level measurements from the deep interior piezometers, as identified in Table 1.0 of the OMPM Plan, is maintained below a Target Leachate Level of 557.1 ft. MSL and that the WMU is effectively dewatered in the vicinities of the shallow interior piezometers as identified in Table 1.0 of the OMPM Plan.



LEGEND

EXISTING MONITORING WELL

EXISTING PIEZOMETER

APPROXIMATE SWMU LIMITS

EXISTING RECOVERY WELL

EXISTING NESTED RECOVERY WELL AND PIEZOMETER

EXISTING DUAL PURPOSE RECOVERY WELL/PIEZOMETER

585 EQUIPOTENTIAL CONTOUR

NOTE:

WHILE THE QUANTITATIVE CAPTURE ZONE(S) ASSOCIATED WITH THE RECOVERY WELLS (RWs) ARE UNDETERMINED, THE EQUIPOTENTIAL CONTOUR DATA QUALITATIVELY CONSIDER THE HYDRAULIC LOWS AT RW-1, RW-5 AND RW-8.

CONTOUR INTERVAL = 10 FEET

PUMPING WELLS RECOVERED BEFORE MEASURING.

WELLS IN OPERATION RW-1, RW-5, RW-8, NRP-25, NRP-26, NRP-27, NRP-28 AND DPW-16.

* = NRP-28 LEACHATE LEVEL WAS RECORDED 12/12/2011.

PRESUMPTIVE CORRECTIVE MEASURES PERFORMANCE MONITORING

SWMU 6 EQUIPOTENTIAL MAP

11/ 27 THROUGH 11/ 30/ 2011

ENVIROSAFE

ENVIRONMENTAL SERVICES OF OHIO, INC.

OHIO FACILITY

DATE

BY

DESCRIPTION

03/01/2012

SSW

2011 ANNUAL REPORT

The Mannik & Smith Group, Inc.

Civil Engineering, Surveying and Environmental Consulting